

Just the Facts...

How to Protect Yourself and Your Family from Hantavirus Pulmonary Syndrome

Hantavirus Pulmonary Syndrome in the United States

Hantavirus Pulmonary Syndrome (HPS) is a serious, often deadly, respiratory disease that is caused by a virus that is spread from wild rodents to humans. HPS is often referred to as "hantavirus". This disease was first recognized in 1993 in an area shared by New Mexico, Arizona, Colorado, and Utah called the "Four Corners". The specific hantavirus that caused this HPS outbreak was isolated by researchers and named "Sin Nombre Virus" (SNV). From 1993 to February 1, 2006, a total of 416 cases of HPS have been confirmed by the Centers for Disease Control and Prevention (CDC) in residents of 32 states, with a fatality rate of 36%. There is more than one genetic strain of hantavirus causing HPS and a number of different rodent hosts have been identified.

Rodent Reservoir

In the United States, deer mice (*Peromyscus maniculatus*), cotton rats (*Sigmodon hispidus*), rice rats (*Oryzomys palustris*), and white-footed mice (*Peromyscus leucopus*) are the primary rodents that carry the virus that causes HPS. Other rodents that may carry strains of hantavirus include squirrels, chipmunks, and other species of rats and mice. There is no evidence that the HPS virus is transmitted by common house mice, Guinea pigs, hamsters, gerbils, farm animals, insects, reptiles, birds, dogs, or cats.

Hantavirus is carried in the airborne (aerosolized) particles of rodent urine, droppings (feces), and saliva. These particles can attach to dust and dirt and accumulate on surfaces. Breathing in the virus is the most common way of becoming infected. However, infection can also occur by touching the mouth or nose after handling contaminated materials. It is suspected that HPS transmission can occur after ingestion of food or water contaminated with virus-infected rodent urine, droppings or saliva. A rodent's bite can also spread the virus. Hantavirus is not spread from person to person. The virus can be killed on contact by most household disinfectants.



Disease Symptoms

The early, flu-like symptoms of HPS include fatigue, fever (101-104°F), and muscle aches. These symptoms appear in all HPS cases and occur as soon as 3 days to as late as 6 weeks after infection with the virus. Sometimes HPS patients experience headaches, dizziness, chills, nausea, vomiting, diarrhea, and abdominal pain. The primary symptom of HPS is difficulty in breathing, caused by fluid build-up in the lungs, which quickly progresses to an inability to breathe. Individuals who think they may have been infected with hantavirus should contact their doctor or public health clinic immediately and be sure to mention any exposure to rodents. HPS is potentially deadly and immediate intensive care is essential once symptoms appear. About half of the people who get HPS die from the illness.

Preventing HPS Infection, Indoors

To reduce the risk of HPS infection, prevention is the best strategy. This simply means taking some very practical steps to minimize contact with rodents. The rodents that transmit the virus causing HPS live near people in rural and semi-rural areas and will occupy woodpiles and any structure. They prefer buildings that are only infrequently occupied, such as barns, outbuildings, and summer cottages or cabins closed up for the season. To eliminate or minimize contact with rodents follow the rule: **AIR OUT, SEAL UP, TRAP OUT, CLEAN UP!**

* Before occupying abandoned or unused structures, open them up to air out. Do not use these structures if signs of rodent infestation are found. Look for droppings and rodent nests. A rodent nest is usually a pile of materials, such as twigs, insulation, styrofoam, and grass under which the rodent lives.

* Preventing rodents from entering or living around your home is very important. Keeping your yard free from trash, litter, junk or debris, which attract rodents looking for food, cover, and protection from many predators, is the best way to keep rodents away from your living areas. Seal all entry holes to your home that are 1/4 inch wide or wider with steel wool, cement or wire screening.

* Keep tight-fitting lids on garbage cans, and discard uneaten pet food at the end of the day. Set and keep spring-loaded rodent traps. Bait the traps with peanut butter and set near baseboards (rodents tend to run along walls and tight spaces). Use an EPA-approved pesticide product labeled for flea and tick control in the trap area. This is important since fleas and ticks will leave the dead rodents and seek out new hosts, including humans. After trapping, soak the traps thoroughly in disinfectant.

* Cats and dogs have not been shown to spread the hantavirus from a rodent to a person. However, allowing your dog or cat to roam free increases the chance it may come upon a rodent, kill it and bring it home as a "trophy" (a commonly reported behavior in cats). This indirectly increases the risk of exposure to pet owners.

*** Those involved in cleaning rodent infested buildings or handling dead rodents are at greatest risk of being exposed to hantavirus and should use proper procedures.**

* Always wear rubber or plastic gloves when handling dead rodents. Place the carcass in a plastic bag containing a sufficient amount of liquid bleach (3 tablespoons per gallon of water), Lysol™, or any other household disinfectant to thoroughly wet the carcass. Seal the bag and then dispose of it by burying in a 2- to 3- foot-deep hole or by burning. Always disinfect gloves (wash gloved hands with disinfectant then in soap and water) before taking them off. After removing gloves, thoroughly wash hands with soap and warm water.

* Persons involved in the cleanup of rodent-infested structures should wear rubber or plastic gloves. Spray disinfectant on areas where any rodents have been trapped, where rodent activity has been noted (looking for fecal droppings, urine staining, and nests), and any other items that have been contaminated by rodents. Soak all sweepings and other discarded materials with disinfectant and place in a plastic bag. Seal the bag, then place into a second plastic bag and seal. If there is regular trash pick-up service, dispose of sealed bags in a garbage can with a tight fitting lid. Contact local or state health department about other appropriate

disposal methods. When cleaning floors, minimize stirring up the dust (which potentially carries the virus on airborne particles) by first spraying the area with disinfectant, then mopping the floor (do not vacuum) once or twice with a soap and disinfectant solution. Carpets and upholstered furniture can be disinfected using commercial-grade steam cleaning or shampooing. Disinfect countertops, cabinets, drawers, and other durable surfaces by washing them with a solution of detergent, water, and disinfectant, followed by wiping down with a general-purpose household disinfectant. Decontaminate the cleanup equipment in the same fashion. Launder potentially contaminated bedding and clothing with hot water and detergent, then machine dry on a high setting or hang it to air-dry in the sun.

***Special precautions (use of appropriate respirators, protective clothing, etc.) should be used for cleaning homes or buildings with heavy rodent infestations in localities where HPS has been reported. The CDC recommends using a half-face air-purifying (or negative pressure) respirator equipped with an N-100 filter. These are available at most Home Improvement Centers. If you are attempting to deal with such a situation, it is also recommended that you contact the responsible military, local, state, or federal public health agency for guidance.**

Preventing HPS Infection, Outdoors

People who work outdoors or enjoy outdoor activities are at a lower risk of acquiring HPS infection. The chances of being infected are lower outdoors since infected rodent urine and droppings are not typically encountered. In addition, direct sunlight will destroy hantaviruses within just a few minutes of exposure. However, you should follow these precautions when hiking and camping to reduce the likelihood of contracting HPS:

* When planning to sleep outdoors, check potential campsites for rodent droppings or burrows.

* Do not disturb rodents, burrows or dens.

* Avoid sleeping near woodpiles or garbage areas that may be frequented by rodents.

* Avoid sleeping on bare ground; use a mat or elevated cots if they are available.

* Store foods in rodent-proof containers; all garbage should be promptly buried, burned or discarded in covered trash containers.

* Do not use cabins or other enclosed shelters that are rodent infested until they have been properly cleaned and disinfected.

* Use only tap, bottled water, or water that has been disinfected by filtration, boiling, chlorination, or iodination for drinking, cooking, washing dishes, and brushing teeth.
